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ple of China from a new point of view. At the instance of these two diplomatists, the Chinese government requested Mr. Pumpelly to examine some of their chief coal-fields, with reference to supplying with fuel the new flotilla of gunboats which had then just been purchased in England. The geological conference, over a lunch with the Board of Foreign Affairs, brought out some curious Chinese hypotheses. Among them was a theory of the growth of coal in abandoned mines: everything being produced by the coaction of *yin* and *yang*, force and matter, the active and the passive, the male and the female, principles in nature, why should not coal be continually produced in circumstances which once favored it?

Under this appointment, Mr. Pumpelly examined the coal-measures to the northwest of Pekin, his account of which has been published in the papers of the Smithsonian Institution; but, on returning to Pekin from this first official reconnoissance, he learned that the Imperial authorities had decided to send back to England the flotilla, and were consequently quite indifferent to the further prosecution of his geological inquiries.

An excursion of six weeks along the great wall, a visit to Nagasaki, and the long homeward journey across Tartary, Siberia, and Russia, furnish abundant materials for further descriptions, — too abundant for any detailed notice here.

Two noteworthy chapters are thrown into the midst of these vivacious narratives, — one on the Chinese as emigrants, and the other on Western policy in China. Both of these are important in their bearing upon the great Chinese problem, which throughout the world now attracts such marked attention from philanthropists and statesmen. With the liberal views of the author the readers of this Review are already acquainted.

We have noticed many typographical slips in our copy of this volume, and some slight literary inaccuracies, but they do not impair the great merits of this work, and, as the publishers have announced a revised edition, require no further notice here.

2. — *Geological Survey of California.* J. D. WHITNEY, State Geologist.

1. *The Yosemite Book: A Description of the Yosemite Valley and the adjacent Region of the Sierra Nevada, and of the Big Trees of California, illustrated by Maps and Photographs.* Published by authority of the Legislature. New York: Julius Bien. 1868. 4to. pp. 116.

2. *The Yosemite Guide-Book: a Description of the Yosemite Valley and the adjacent Region of the Sierra Nevada, and of the Big Trees of California, illustrated by Maps and Woodcuts.* Published by authority of the Legislature. 1869. University Press: Cambridge. 8vo. pp. 155.

IN 1864 the United States Congress passed an act granting the Yosemite Valley and the Mariposa grove of "Big Trees" to the State of California, "upon the express conditions that the premises shall be held for public use, resort, and recreation, and shall be inalienable for all time," etc. The State accepted the gift with the imposed conditions, and appointed commissioners to take charge of the property. Professor Whitney was one of them. In his official capacity as State Geologist, he had previously devoted considerable attention to that region, but under the new condition of things he extended his explorations and surveys, and in these volumes the results are given to the public. They are in fact two editions of the same work, — the first a sumptuously prepared "gift-book," of which but two hundred and fifty copies were published; a work of art, illustrated by twenty-eight full-page photographs, taken by Watkins, who was before widely known for his artistic photographs of that region. The second contains, in a form more suitable for a "guide-book," essentially the same text, with some verbal corrections and the addition of about twenty pages to the chapter relating to "the High Sierra," and is illustrated with woodcuts selected from those already used by the same author in the first volume of the "Geology of California."

It is fortunate that we have these descriptions from a master, whose powers find here a worthy theme, and whose reputation as a man of science is a guaranty of accuracy of statement. The prominent features of the scenery of the region here described are unique. High mountains, lofty waterfalls, deep valleys, towering precipices, and grand forests belong to every continent, yet there is but one Yosemite, and one restricted *habitat* of the "Big Trees," the giant Sequoias.

The Merced River rises in the Sierra Nevada, about one hundred and seventy-five miles in a direct line from San Francisco, and in nearly the same latitude, in a conspicuous group of peaks, the highest of which rise to above thirteen thousand feet. It flows westward to the San Joaquin, its waters ultimately reaching the Pacific by the latter river. The valley of the Merced proper is about seventy miles long, and in that short distance sinks from the altitude of the above-mentioned high peaks nearly to the level of the sea, eight thousand feet of

this fall occurring on the upper fifteen miles. This river, whose entire length is not one fourth that of the Hudson, or less than the distance from New York to Poughkeepsie, collects its waters amid the perpetual snows of an arctic climate, and pours them into a valley of almost tropical heat. The extreme upper branches, gathering their waters from the snow-banks of numerous peaks, and from the alpine lakes that lie among them, flow in rather open valleys, lying entirely above the altitude of seven thousand feet, whose sides are all polished by former glaciers, through alpine meadows or "flats"; then suddenly pour in numerous waterfalls over the rocky walls of a grand chasm, from three thousand to five thousand feet deep, and unite in this with the main river, which finds its way westward through a deep V-shaped ravine or cañon. This passes down through the forests, through the mining-belt, then winds a short distance between the gentle foot-hills, to find its way to the great San Joaquin plain. A small portion of this valley — the chasm before spoken of, some six or eight miles long — is known as the Yosemite Valley. In its geological features this is not peculiar, for the valleys of other streams in the same belt of the Sierra, both on the north and south, from the Hetch-Hetchy on the Tuolumne to the Upper Kern, have a similar character; but in no other are there so many striking features, nor such a combination of grand scenic effects. It is in an æsthetic rather than in a strictly geological sense that the valley is unique.

"The principal features of the Yosemite, and those by which it is distinguished from all other known valleys, are, first, the near approach to verticality of its walls; second, their great height, not only absolutely, but as compared with the width of the valley itself; and, finally, the very small amount of *talus* or *débris* at the base of these gigantic cliffs." These are the great characteristics of the valley throughout its whole length; but besides these there are other striking peculiarities, of even greater interest to the tourist, — features of sublimity and beauty, which can hardly be surpassed, if indeed equalled, by those of any other mountain valley in the world. Among these are particularly the domes, the waterfalls, the purity and transparency of the air, and the brilliancy and variety of atmospheric effects.

The description of this valley and its surroundings occupies, of course, the greater part of the volume, and in no other guide-book have we seen so charming a combination of scientific accuracy with poetic sensibility. The Yosemite waterfall is the highest yet discovered on the globe, being about two thousand six hundred feet (nearly half a mile) high. Several others in the valley rank in the first class; and to a description of these is appended, for comparison, a short account of the

highest waterfalls of other countries. The precipice of the "Half-Dome," nearly a mile high,—in half of that height being absolutely vertical, and in the rest nearly so,—is perhaps the most remarkable precipice in the world. The various "Domes," some of them almost as symmetrical in form as the domes of art, are features scarcely less striking, and their heights are given in thousands of feet almost as familiarly as we talk of other great heights in hundreds.

Over the whole of the elevated region which drains into the Yosemite, the snows of winter fall to a depth of twenty, thirty, and, in some years, even of fifty feet. This snowy winter is followed by a long rainless summer, when for months the sky is almost cloudless. Then the snows melt with great rapidity, and disappear, except at altitudes above eleven thousand feet. The Yosemite has an altitude of about four thousand feet above the sea. A lake probably occupied the bottom of this chasm in earlier geological ages; but now it is a comparatively level park, six or seven miles long, and from three fourths of a mile to two miles wide, with forests and meadows beautifully intermingled, through which the river meanders as if resting after the tumult it has passed through, and recovering strength for the passage of the dreary cañon below. Near the upper end there is one lovely little lake, on whose glassy surface are mirrored the gigantic walls of granite which bound the valley.

In the spring, while the snow still lies in great, unbroken fields above, the green valley and the profuse and brilliant flowers make a contrast even more striking than that of the *Jardin* in the *Mer de Glace*. As the snows rapidly melt under the fervid sun, the streams become torrents, rushing down the upper valleys, and tumbling over the great walls in thundering cataracts, showering their spray far and wide over the fairy scene below. At the same time numerous smaller rivulets pour over the edge of the precipices,—here in mere threads of spray three thousand feet high, there in cascades of greater size,—but all dwindle or dry up as the summer advances. Even *Pohono*, or the "Bridal-Veil Fall," over eight hundred feet high, which is a great cataract in the spring, by midsummer is but a mere sheet of spray, falling, white and airy as a lace veil, from the brow to the foot of the dark granite precipice, and waving hither and thither with the changing breeze. Still later it is reduced to a mere thread, or disappears entirely. As the summer passes into autumn, only the large streams remain, and these are but feeble representatives of what they were a few months before. Then the valley is bathed in that delicate haze which no painter has yet successfully represented upon canvas; the meadows

are sere, the air parched, and strange colors play over the mountain-summits above.

From this valley the author carries us to the High Sierra, beginning with the region back of the Yosemite, — a region which rivals the Alps in interest, being greater in mass, and scarcely inferior in height. There is less of variety and beauty in these mountains than in the Alps, but they possess perhaps even more grandeur and sublimity. This group of peaks, of which Mount Dana is the highest, will probably remain the most popular region of the High Sierra for tourists to visit, because more accessible, and more varied in scenery, than any other of equal altitude. South of this is a higher group of peaks, lying near the head of Kern River, of peculiar interest, because its highest point, Mount Whiting, is the highest peak known in the United States, — fifteen thousand feet; and this is surrounded by over half a score of other mountains rising to above fourteen thousand feet.

The last chapter of the Guide-Book is devoted to the "Big Trees," and we have here the fullest account yet published of the objects themselves, of their history, and of the remarkable Indian, Sequoyah, in whose honor the genus was named.

This Guide-Book is not a mere compilation of facts already given to the public. The world has heard of the Yosemite, of the High Sierra Nevada, and of the giant Sequoias; but this book is the result of original explorations, surveys, and researches, made under the author's direction, and continued at intervals from 1863 to 1868.

The two maps which accompany the volume are of peculiar interest and excellence; one is a map of the Yosemite itself and its immediate surroundings; the other, of the whole of that portion of the High Sierra which extends from the mining-belt on the west to the eastern base at Mono Lake, — an area of upwards of twenty-seven hundred square miles. This map is drawn on a scale of two miles to the inch. The district thus portrayed is one of the roughest mountain regions in the United States, if not in North America, and this map is the first topographical representation, with minute accuracy of detail, of any similar mountain region on the continent. The field-work which served as its basis involved an amount of laborious exploration, fatigue, difficulty, and danger, which would make a thrilling narrative; though all this is merely hinted at in the work before us. The book and its maps rise therefore out of the class of mere guide-books, and take a high place among the contributions to American science. We earnestly hope that the Golden State will enable the same author to give us similar descriptions of other parts of that land of marvels.